

## U.S. Fish and Wildlife Service

### **LANDBIRD MONITORING ACTIVITIES AT THE ALASKA PENINSULA/BECHAROF NATIONAL WILDLIFE REFUGE, ALASKA PENINSULA, ALASKA, JUNE 2014**

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**September 2014**

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**Photo: USFWS, J. Howell**

U.S. Fish and Wildlife Service  
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The mission of the National Wildlife Refuge System is to administer a national network of lands and waters for the conservation, management, and where appropriate, restoration of the fish, wildlife, and plant resources and their habitats within the United States for the benefit of present and future generations of Americans.

Key Words: Alaska Landbird Monitoring Survey, Alaska Peninsula, Becharof, Breeding Bird Survey, King Salmon, landbirds, monitoring, point counts

Photo: Sunrise over the Kejulik Mountains near a sample point.

Suggested Citation:

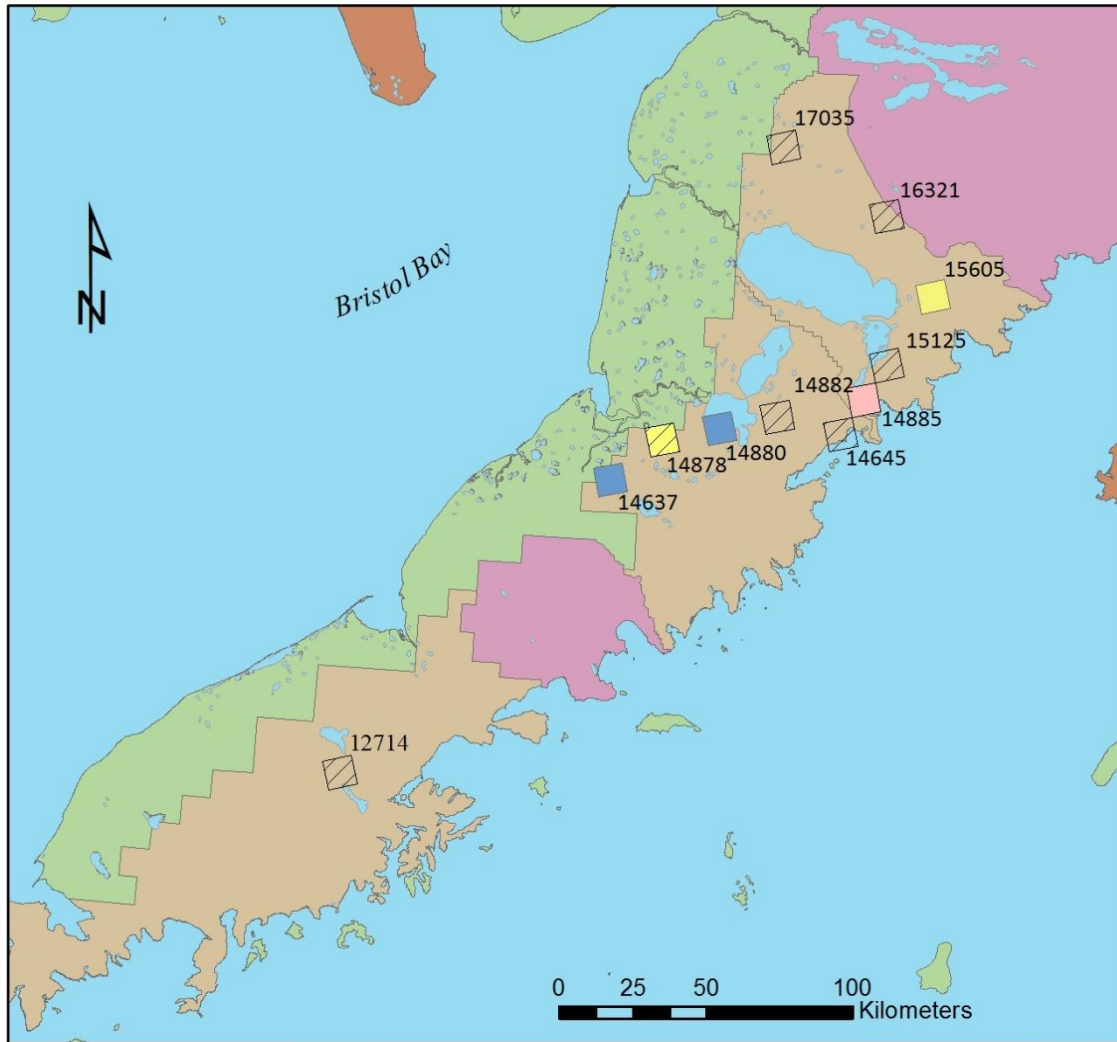
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## Background

The Alaska Landbird Monitoring Survey (ALMS) program is a cooperative statewide program established to monitor population trends of landbirds and other birds across roadless areas of Alaska. Developed from Off-road Point-count (ORPC) efforts encouraged by Boreal Partners in Flight in the 1990s, and coordinated by US Geological Survey-Alaska Science Center (ASC) Wildlife Biologist Colleen Handel, the project is designed to complement the road-based Breeding Bird Survey (BBS). Because most of Alaska is roadless, the success of landbird monitoring in Alaska relies on implementation of ALMS. The first ALMS blocks were attempted in 2004 by the Alaska Peninsula/Becharof NWR (Refuge), which completed five helicopter accessed (Gertrude Creek, Bearskin Creek - Chignik Lake, North King Salmon River, Bear Creek – Becharof, Deer Mountain - Ugashik Lake) and two fixed-wing accessed (Dog Salmon and Wide Bay) ALMS blocks (Sesser & Jehle, 2005). Because of the expense of helicopters, this effort was not supported by most other federal conservation units. The program was altered from selecting random blocks across all federal lands to selecting random blocks from areas that were fixed-wing accessible. The Refuge submitted a fixed-wing accessible GIS shape file to Handel in 2005 and again in early 2011. Under the new sampling regime, the Refuge is slated for four ALMS blocks (Handel and Matsuoka 2007), two to be surveyed in each of two consecutive years, with ongoing repetition of the cycle. Refuge management has supported our involvement in this program. Past partners have included the State of Alaska through their Wildlife Grant Program which funded the now defunct Alaska Bird Observatory (ABO) to training and provide roving crews to other entities. Recently the Inventory and Monitoring branch of the USFWS Region 7 Natural Resources program has supported efforts in individual Refuges.

Our participation since 2004 has included: Refuge staff repeated the Dog Salmon survey (2007, part of the original set of plots); ABO staff with Refuge support completed the Dog Salmon Survey and attempted the Wide Bay survey (2010, also part of the original set of plots; Savage 2010); Refuge staff completed two new blocks (2011, Lower Ugashik Lake and King Salmon River South) and resampled the Lower Ugashik Lake block (Savage 2011); Refuge staff visited the Dog Salmon block and established a new block on the Kejulik River (2012, Savage & Payne 2012); and Refuge staff revisited the blocks established in 2011 (2013, Savage & Johnson 2013). This year we revisited the blocks visited or established in 2012; to date, we have established our complement of four blocks (Figure 1) and revisited each at least one time.

In addition to the ALMS activities, the Refuge has a long-standing record of participating in other landbird monitoring efforts (e.g., banding stations at Mother Goose and Becharof Lake [Egan & Adler 2001, Adler & Savage 1999] and tree swallow monitoring [Howell & Savage In Prep]). The first author established the King Salmon BBS in 1993 while working as a biologist for Katmai National Park. Since 1997, when Savage became a Wildlife Biologist at the Refuge, the project has been a regular part of the Refuge's biological inventory program as well as contributing to the statewide and nationwide effort (Savage 2013). In 2013, we initiated an ORPC along the Kanatak Trail (Savage & Johnson 2013). This year we revisited the route but were unable to complete a survey due to challenging weather conditions. This report will detail all landbird point count activities conducted in 2014.



### Legend

Private & State Lands

#### Federal Conservation Units

Other NWRs

Alaska Peninsula/Becharof NWR

National Park Service Areas

#### ALMS & ORPC Blocks Surveyed by Year

2004

2011 & 2013

2012 & 2014

2013 & 2014



**Figure 1.** Map of Alaska Landbird Monitoring Survey and Off-Road Point Count blocks completed on the Alaska Peninsula/Becharof NWR, 2004, 2007, and 2010-2014.



## Methods

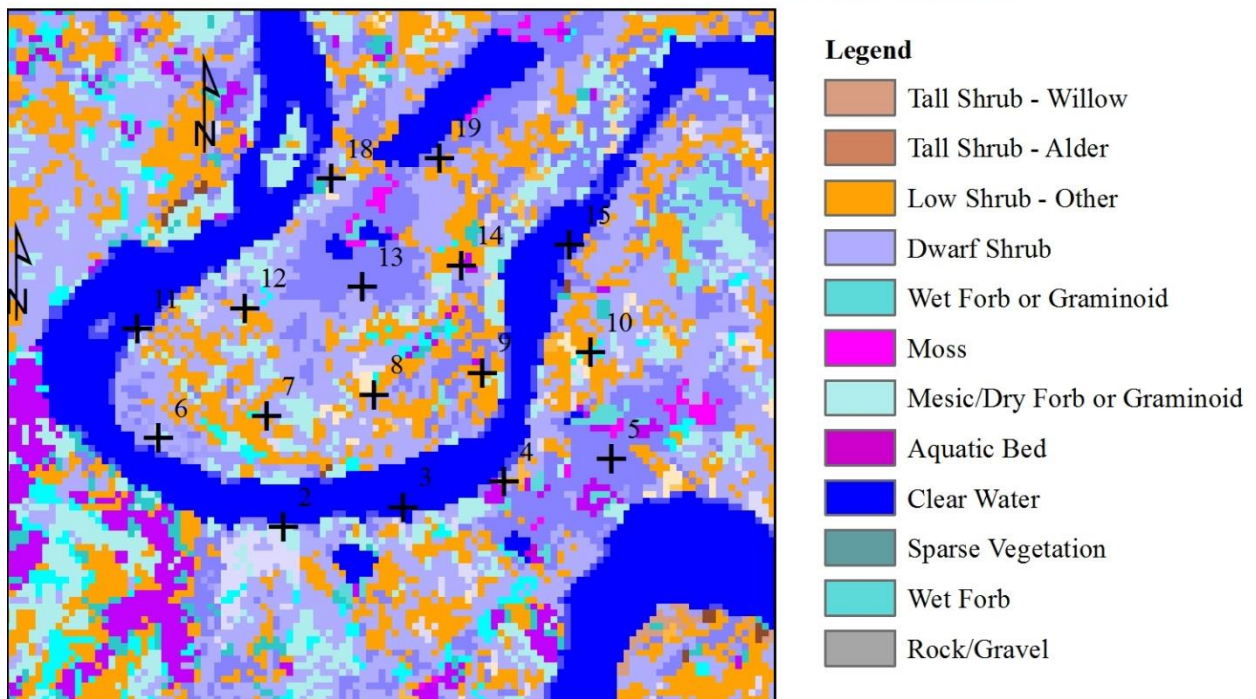
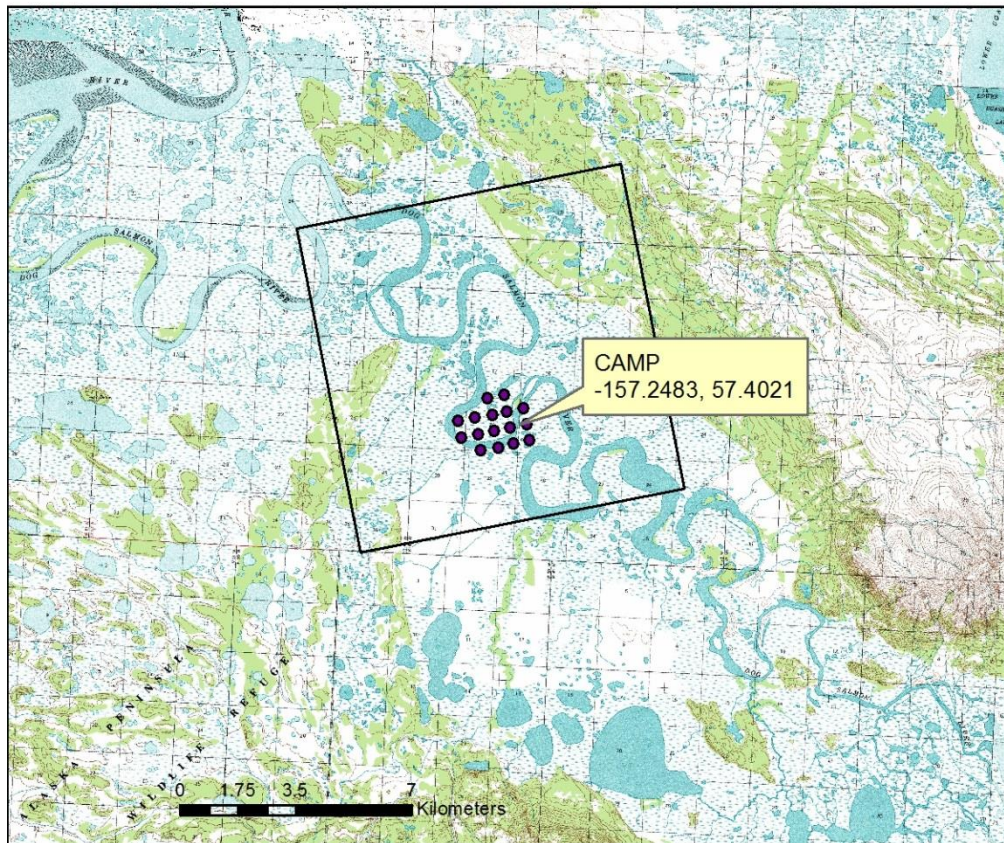
The King Salmon BBS follows standard BBS protocol (see <https://www.pwrc.usgs.gov/bbS/participate/instructions.html>). It begins at the Katmai National Park Lake Camp parking lot and ends on the Beach Access Road in Naknek just before the road accesses the beach (Figure 2). The same 50 stops were visited in 2014 as for the previous 21 years.



**Figure 2.** Location of point count stops on the King Salmon, Alaska Breeding Bird Survey, 1993-2014.

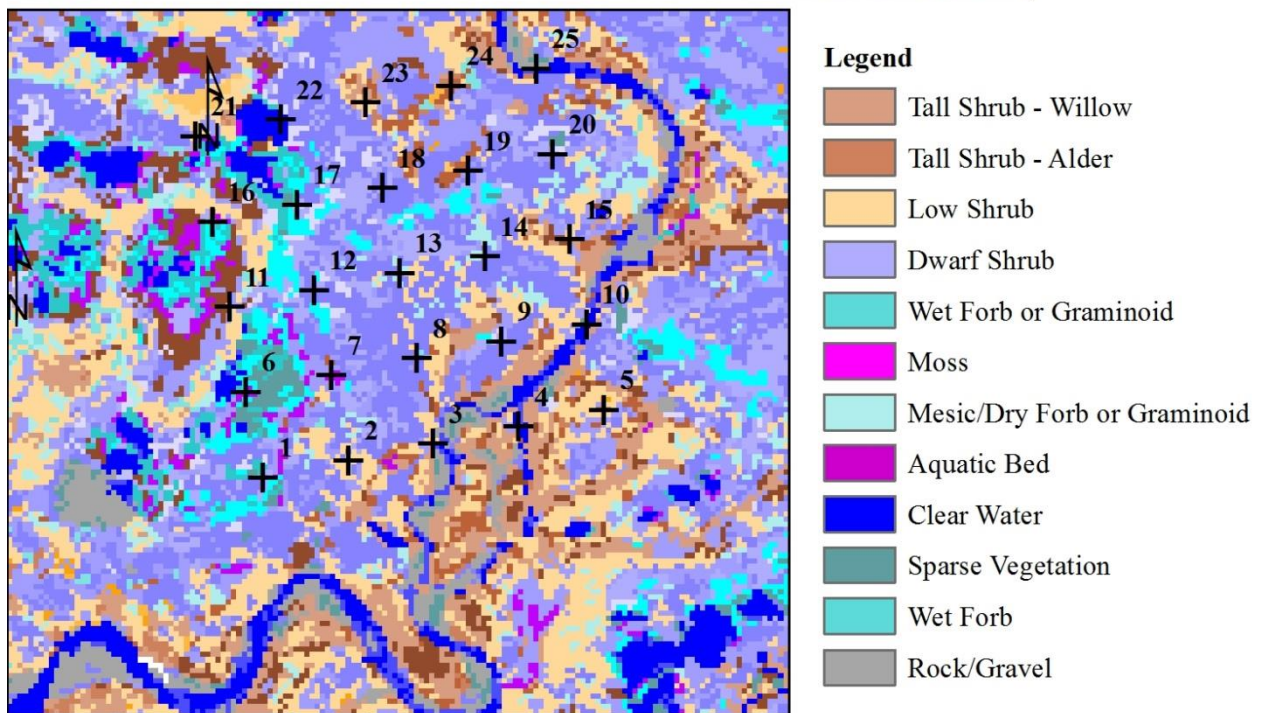
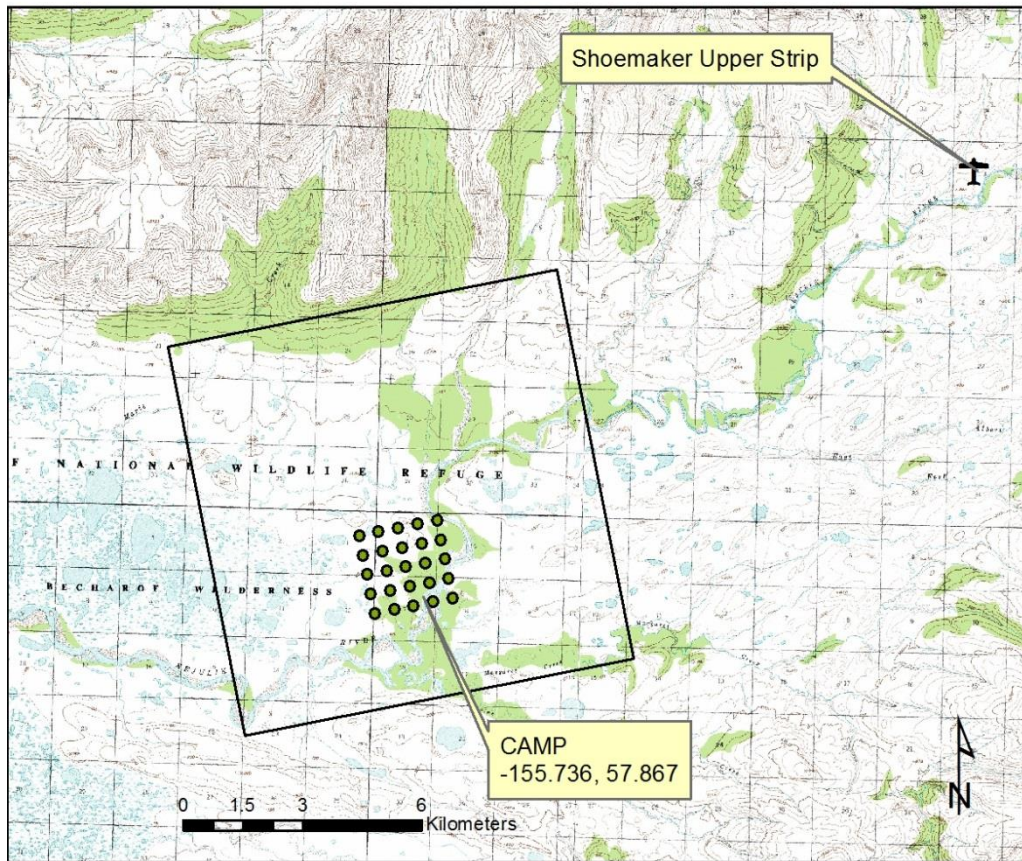
The current ALMS survey followed the protocol developed in 2004 (Handel & Cady 2004), with a minor change to the Habitat Description data sheet (a check box added under the Vegetation: Shrub “Total Cover < 25 %”). Team members were trained with all required USFWS safety training, practiced with local bird songs, and distance estimation. We revisited the same points at Dog Salmon (Block 14878; Figure 3) that have been used since 2004 and revisited the same points as 2012 on the middle Kejulik River (Block 15605, Figure 4). This year habitat data were only collected at Dog Salmon, however photographs were collected at both ALMS blocks. In addition to the ALMS Bird and Mammal summary checklist, which is summarized over the entire visit, the crew also recorded daily checklists using the Refuge’s Plot Summary Form for incidental observations. The ORPC would have followed ALMS protocol for point counting and vegetation monitoring had weather allowed; the only variance from this protocol is in the layout of the points. All equipment (safety, camping, boating, and survey) was provided by the Refuge; transportation was paid for with Refuge funds using Refuge or charter company Katmai Air aircraft. The USFWS Regional Inventory & Monitoring Program also provided some financial support for the survey.





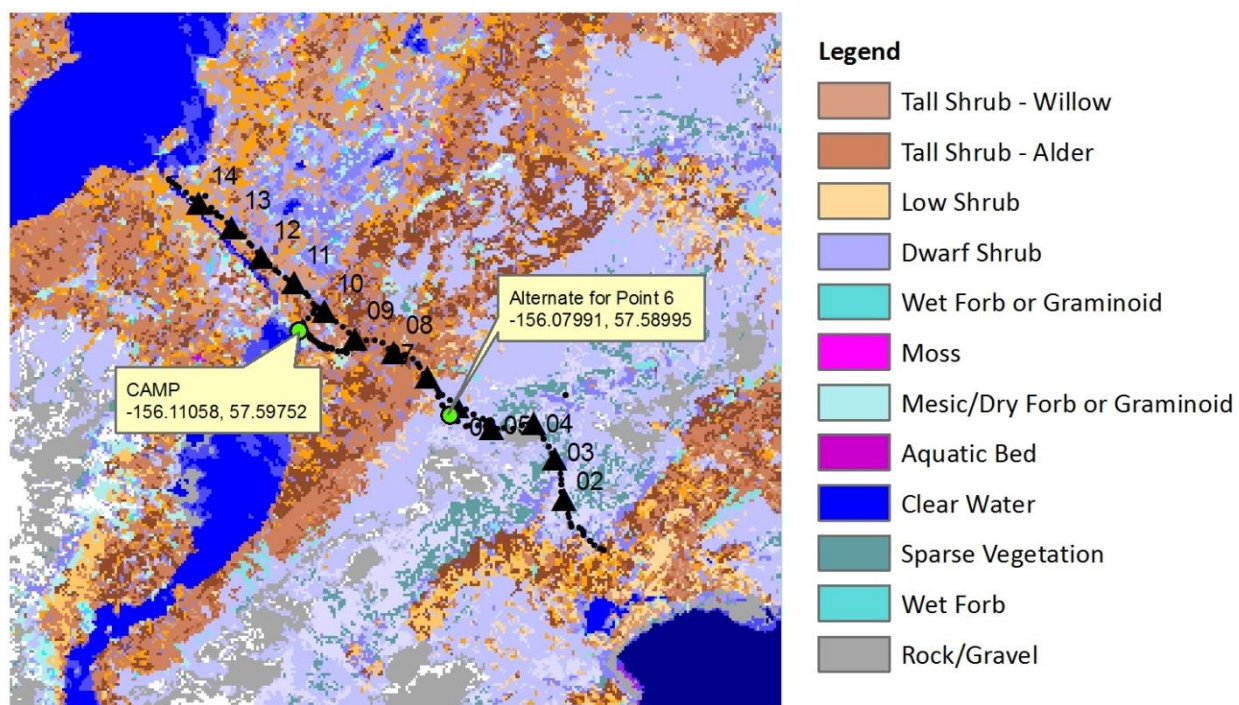
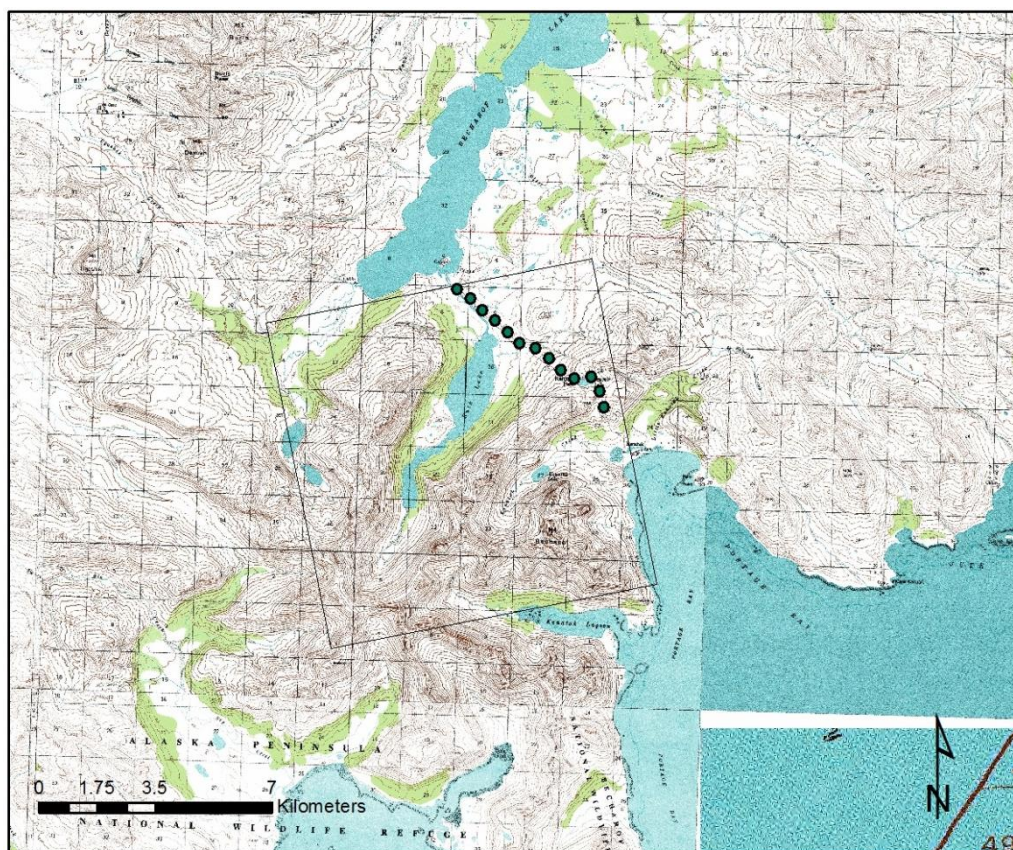
**Figure 3.** Map of general location of the Dog Salmon ALMS block (14878) and close-up showing land cover at point count locations, Landbird Monitoring, Alaska Peninsula/Becharof NWR, 2014.





**Figure 4.** Map of general location of Kejulik ALMS block (15605) and close-up showing land cover at point count locations, Landbird Monitoring, Alaska Peninsula/Becharof NWR, 2014.





**Figure 5.** Location of point count stops along the Kanatak Trail Off-Road Point-Count, Landbird Monitoring, Alaska Peninsula/Becharof NWR, 2014.



Paper<sup>1</sup> and digital data records reside at the Refuge; PDF and JPG copies of the ALMS data forms and photos were sent to Handel. We entered the BBS data into the USGS Breeding Bird Survey web page and sent paper copies to the USGS BBS office in Patuxent, MD. The bird point count and vegetation data were digitized into the Refuge's Access database for ALMS<sup>2</sup>; while a summary of BBS data was kept in an Excel file<sup>3</sup>. The daily checklists taken during ALMS were entered into the Refuge's Access database for incidental observations<sup>4</sup>. Digital photographs of the ALMS surveyed habitat are stored at USGS-ASC and the Refuge<sup>5</sup>.

We summarized all point count data for each location by the number of birds detected and the number of points where each species was detected for each year. For Breeding Bird Survey data, we calculated the mean over 22-years for number of birds and number of points for species consistently recorded in most years. To further examine species trends, we compared this year's counts and number of points against the 22-year mean  $\pm$  one standard error (only for species where the long term mean rounded to five or more birds). Incidental data (checklist of all birds seen on the ALMS blocks during visits) were summarized by highest breeding score and highest relative abundance score per block. Habitat data for the Dog Salmon ALMS plot were summarized by Viereck (Viereck et al. 1992) class level III. Mammals were summarized by the highest level detected.

### Results & Discussion

Wildlife Biologist Savage completed the King Salmon BBS (50 stops) on 4 June; Wildlife Intern Howell participated as an avian observer-in-training and Volunteer Blush drove and recorded passing vehicles and weather conditions. Savage and Howell visited the Dog Salmon (9 – 12 June) using a Katmai Air Cessna 206 on floats for transportation; they completed 16 avian point counts and 16 habitat surveys. Inclement weather prevented Maintenance Worker Payne's (who formally worked as a Biological Science Technician for the Refuge) return from a previous assignment until 19 June; the windy and wet weather would have precluded surveys anyway. Payne and Howell visited the Kejulik (21 – 26 June) using the Refuge Husky on wheels to arrive at Phil Shoemaker's<sup>6</sup> Upper Kejulik strip, and a Refuge Incept inflatable canoe to float to the plot. At the Kejulik plot they had one day of inclement weather that precluded sampling, but then completed 20 avian point counts. They then floated to the mouth of the Kejulik River. Low water and unfamiliarity of the pilot with the river required the crew to paddle to the mouth of the Kejulik River rather than being picked up upstream as we had been in 2012. They were transported to Ruth Lake for the Kanatak ORPC by Katmai Air Cessna 206 on floats. Low water and unfamiliarity of the pilot with the river required the crew to paddle to the mouth of the Kejulik River. They visited Ruth Lake for two nights (26 – 28 June), but high winds prevented avian surveys. In 2013, point 6 was close to a waterfall so Savage asked the crew to relocate the point to the "alternative" trail route. This was done and vegetation data was collected at the new point (Figure 5). To provide guidance to future crews, logistical details for each block are given in Block Summaries (Appendix I).

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<sup>1</sup> Notebooks in the Library for ALMS and files in the biological file archive for BBS

<sup>2</sup> Savage's My Documents\Biology\Bird General\ALMS\ALMS AKPB NWR(most recent date).mbd

<sup>3</sup> Savage's My Documents\Biology\Bird General\BBS&ORPC\bbsdata1.xls

<sup>4</sup> Savage's My Documents\Biology\Bird General\incidental avian\AccessDatabasefrom 2004 on\Incidental Database (most recent date).mbd

<sup>5</sup> Savage's My Documents\My Pictures\Photos 2014\ALMS

<sup>6</sup> Permission was granted from Phil Shoemaker to use the strip on 13 June 2014.

Table 1. Number of individual birds observed (#), and number of points observed (pt) for the King Salmon Breeding Bird Survey , 2010 to 2014.

	2010		2011		2012		2013		2014		AVG	StDev	AVG	StDev
Species*	#	pt	#	pt	#	pt	#	pt	#	pt	#	#	PT	PT
Tundra Swan	13	2	6	3	3	2	5	5	2	2	19.4	20.7	5.1	3.9
American Wigeon			1	1	2	2	3	3						
Mallard	3	3	1	1										
Northern Pintail									2	1				
Green-winged Teal							2	2						
Greater Scaup					1	1								
Black Scoter	6	5	9	7	13	2	6	6	9	2	10.3	15.4	3.5	2.6
Long-tailed Duck														
Common Goldeneye			1	1			3	1	1	1				
Willow Ptarmigan			2	2										
Red-throated Loon	1	1	0	0	0	0	0	0	0	0	1.2	1.7	1.2	1.5
Pacific Loon			1	1										
Common Loon	2	1	4	4	0	0	0	0	2	2				
Red-necked Grebe	1	1	1	1										
Bald Eagle	3	1	0	0	0	0	0	0	1	1				
Merlin	1	1					0	0						
Sandhill Crane	8	6	5	4	5	3	10	7	0	0	4.6	3.4	3.2	2.1
Black-bellied Plover			1	1			2	2						
Pacific Golden-plover	1	1	2	2			1	1						
Semipalmated Plover							1	1	1	1				
Spotted Sandpiper			1	1										
Greater Yellowlegs	7	7	9	9	11	10	17	15	23	18	12.5	5.6	10.6	4.7
Hudsonian Godwit	3	1	1	1	0	0	1	1	3	3	1.5	1.2	1.3	1.2
Least Sandpiper	4	4	6	5	1	1	5	5	3	2	4.4	2.4	3.3	1.9
Short-billed Dowitcher	2	2	2	2	3	3	3	3	1	1	2.6	1.9	2.4	1.9
Wilson's Snipe	10	10	17	14	22	17	12	11	17	16	16.5	8.6	13.4	6.7
Parasitic Jaeger									1	1				
Long-tailed Jaeger	0	0	1	1	2	2	0	0	0	0				
Mew Gull	1	1	1	1	0	0	3	2	2	1	1.6	1.3	1.2	1.0
Glaucous-winged Gull	12	5	5	4	21	6	7	2	24	8	17.3	12.3	7.6	4.0
Aleutian Tern	3	2	3	2	6	2	85	2	10	3	7.3	18.9	0.9	1.0
Arctic Tern	0	0	1	1	2	1	1	1	0	0				



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	2010		2011		2012		2013		2014		AVG	StDev	AVG	StDev
Species*	#	pt	#	pt	#	pt	#	pt	#	pt	#	#	PT	PT
Gray Jay	5	4	9	6	2	2	24	18	7	7	7.3	5.6	5.6	4.1
Black-billed Magpie	3	3	1	1	3	3	1	1	0	0				
Common Raven	12	4	6	5	2	2	6	5	9	8	14.6	7.9	8.0	4.2
Tree Swallow	12	8	3	3	3	3	6	5	14	10	16.0	9.8	8.4	3.6
Bank Swallow	13	5	11	2	6	2	5	2	10	1	17.6	13.6	3.8	2.3
Black-capped Chickadee	0	0	0	0	2	2	0	0	3	3				
Boreal Chickadee	2	2	0	0	0	0	0	0	1	1				
Gray-checked Thrush	18	15	26	17	33	24	39	24	24	21	27.1	11.8	20.5	7.1
Swainson's Thrush	1	1	1	1	0	0	0	0	0	0				
Hermit Thrush	1	1	3	3	1	1	0	0	3	2	1.8	1.6	1.7	2.0
American Robin	60	39	67	39	66	37	58	38	89	42	78.9	18.5	39.7	9.6
Varied Thrush	11	8	13	12	9	5	3	3	9	7	15.4	8.9	11.8	8.7
Lapland Longspur	10	5	12	6	5	2	7	4	5	3	19.1	11.5	8.6	5.8
Northern Waterthrush	2	1	3	2	5	3	6	5	1	1	3.0	1.9	2.3	1.6
Orange-crowned Warbler	30	25	40	28	27	22	52	32	21	15	32.4	10.7	22.7	6.9
Yellow Warbler	12	8	13	8	9	7	13	8	9	7	14.9	5.3	9.3	3.5
Blackpoll Warbler	15	13	21	18	16	15	20	16	29	21	20.1	6.9	16.8	4.8
Myrtle Warbler	22	17	28	21	24	16	24	18	23	14	15.4	6.7	11.9	4.8
Wilson's Warbler	45	31	59	36	50	27	44	25	41	28	40.6	9.3	27.3	4.4
American Tree Sparrow	28	22	39	23	25	21	28	18	23	15	54.0	20.1	28.8	6.7
Savannah Sparrow	24	16	26	15	19	14	24	18	20	16	14.7	6.5	11.2	4.5
Fox Sparrows	14	13	25	18	29	17	33	24	38	25	21.7	7.7	16.3	4.5
Lincoln's Sparrow	3	3	3	3	7	6	3	3	1	1				
White-crowned Sparrow	94	41	65	36	97	45	64	38	57	32	70.9	20.7	38.0	6.2
Golden-crowned Sparrow	4	4	3	3	3	3	1	1	4	3	6.7	3.3	6.1	2.9
Slate-colored Junco	4	4	3	3	7	6	4	3	3	3				
White-winged Crossbill			1	1										
Common Redpoll	17	13	16	14	10	8	11	8	26	22	28.0	13.5	19.1	6.7
Vehicles	52	23	89	22	65	23	47	16	90	21	49.3	20.7	18.5	3.2
Excess Noise	1	1	0	0	1	1	2	2	1	1				
Total Individuals	542		578		552		644		572		637.4	77.6		
Species total	44	5	49		38		41		41		41.0	4.2		
Date	6/5	1/3	6/6		6/9		6/8		6/4					
Passerine/Shorebird total	497		541		502		528		518		571.8	65.3		

\* Species arranged according to the 54 Supplement to the American Ornithologists' Union Check-list of North American Birds (Chesser et al. 2013).

The BBS results were fairly typical of what has been observed for the last five years, however the total bird count and total passerines plus shorebird count continue to be low compared to the 22-year average. Table 1 provides the total number of individuals of each species observed for the entire route, and the number of stops (points) that each species was observed for the last five years. Count and point averages and standard deviations, given for species observed in most years reflect all 22-years of survey. We did not detect any new species, although northern pintail (See Appendix II for Scientific names) and parasitic jaeger had not been detected in the last five years. The total number of individuals (572) was very close to the five-year average (577), but below the 22-year average (637). The number of species observed matched the 22-year average (41). The number of vehicles counted (90) exceeded the past record of 89 (2011) and exceeded the five-year (69) and 18-year<sup>7</sup> averages (49). A quick examination of the weekday versus the weekend pattern of vehicles over the 18-years of data revealed the mean vehicle count during the week was 72 (n=5), on Saturday was 47 (n=9; t test comparing weekday to Saturday significant,  $p = 0.004$ ), and on Sunday was 26 (n=4; t-test significant comparing Saturday to Sunday,  $p = 0.006$ ). Obviously, it is preferred to conduct the survey on the weekend. This year Savage needed to conduct the ALMS survey at Dog Salmon with travel on Monday 9 June. Because of the unpredictability of weather we did not feel we could wait for the weekend of 7-8 June and completed the BBS as soon as possible after species arrival during the previous business week.

Using deviations greater or less than one standard error from the mean, we highlighted species totals that were higher than (orange) or lower than (blue) average (Table 1). Since the primary target species groups are landbirds and shorebirds, we prepared a subtotal of these groups. This year's total shorebirds/landbirds was below the 22-year average (518 vs. 572), but close to the 5-year average (517). Notably absent or low on the 2014 count were tundra swans, and cranes. Since 2000, the first author has been ignoring swans heard on the river (non-breeders and impossible to count aurally) and concentrated only on pairs or small groups on visible ponds; this partially accounts for the lower than average total count. Barring the flock of five black scoters on the last point, this species would have also been low. Detection of other waterfowl, waterbirds, and raptors is often patchy and this year it was markedly more so. Greater yellowlegs and Hudsonian godwit numbers/points detected and Wilson's snipe numbers/points detected were above average, but those of least sandpiper and short-billed dowitcher were lower.

With regard to songbirds, many species have shown a five year trend to be above or below their long-term average. A few species show more inter-year variability. Gray jay counts returned to average after last year's high while common ravens were lower than average. Gray-cheeked thrush numbers were lower than average this year after two years of above average counts and two years of below average counts. However American robin numbers exceeded the average this year (although the species was counted on an average number of points); robin counts had been low over the previous four years. Three warblers were less common (Northern waterthrush, orange-crowned warbler and yellow warbler), while blackpoll and myrtle warbler exceeded averages, and Wilson's warbler was average. Savannah and fox sparrow and slate-colored junco have been above, while American tree sparrow and golden-crowned sparrow have been consistently below the long-term average. White-crowned sparrow counts were low this year, but varied significantly over the last five years. Lastly, the resident common redpoll showed average numbers and points after the previous four years of below average detections.

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<sup>7</sup> Vehicles were not counted until 1997.



Annual arrival phenology data for King Salmon has not yet been compiled but the general impression is that most species arrived at least by average arrival dates. The observation made in last year's summary, about a species arrival time and relative detection numbers did not fit well in 2014. However, another unusual spring weather pattern dominated in 2014. The spring was unseasonably warm with every month since January above the 80 + year mean. Precipitation through the spring was mixed until April, which was drier than average by ~50%. This pattern carried through the end of May, when record heavy precipitation broke that trend. However, while Alaska had a warm winter, many parts of the lower 48 had a very cold and snowy winter extending into the spring. This may have compromised some avian species' migration patterns.

Regarding the BBS route, habitat continues to be degraded at point 43 (just past the Leader Creek bridge) and point 44 as mentioned in Savage (2013). Most of the heavy construction at point 44 is completed, but industrial operations at the fish processing plant have begun.

At Dog Salmon ALMS block (14878), 32 species were observed during the visit (Table 2). Total species diversity was greater than 2010 and 2012 (26 and 30 species respectively), but less than in 2004 and 2007 (37 and 35 species). Waterfowl species diversity was high; common goldeneye was added to the plot list, but black scoters, a regular in past years, were not observed. As in 2010 and 2012, no raptors (including short-eared owls) were observed this year. Willow ptarmigan, common loon, mew gulls, and sandhill crane continue to be regularly observed species on the plot. We observed nine songbird species, up from eight and seven in 2010 and 2012, but lower than in 2004 and 2007 (10 and 11 species, respectively).

On the Kejulik ALMS block (15605), 42 species were observed (Table 2); at the upper Kejulik strip and on the float day, 33 species were observed. In the 2012 report (Savage & Payne 2012) the float day data was combined with the ALMS plot. This year we re-sorted the 2012 data to be comparable to 2014; the float day was compiled with the Upper Kejulik plot resulting in 36 species observed on the plot and 33 species on the upper plots including the float. Waterfowl and passerines dominate all of the lists. Since this was only the second ALMS visit to the area, new species would be expected and included: common goldeneye, red-necked grebe (as opposed to an unidentified grebe in 2012), double-crested cormorant, marbled godwit, glaucous-winged gull, arctic tern, and black-capped chickadee. As on the Dog Salmon, willow ptarmigan, mew gulls, and sandhill cranes were well represented, but red-throated loon were observed as opposed to common loon. Greater yellowlegs were present on all Kejulik plots. Note that the marbled godwit is outside of the area on the Alaska Peninsula where this species is normally detected. On the ALMS plot we detected 16 passerines in 2014, 15 in 2012 and 17 in both years on the upper Kejulik. As in 2012, alder flycatchers and northern waterthrush were detected along the upper Kejulik River, but not at the ALMS plot.

The species count from the Kanatak visit yielded 20 species this year compared to 26 species in 2013. The 20 species observed represented a subset of the 26 observed in 2013 with the addition of common raven. Likely, the windy weather during this year's visit, fewer days at the plot, and the lateness of the season decreased the detection of some species. We continued to note the absence of white-crowned sparrows in recent years on the Dog Salmon, along the Kejulik River, and at Kanatak. This species was encountered regularly on monitored plots in the Dog Salmon (Wilk & Wilk 1989), and more rarely in the Island Arm including Ruth Lake area (Dewhurst et.

Table 2. Avian species observed, including relative abundance (RA) and highest level of breeding behavior (BS), on the Dog Salmon (14878), Kejulik River (15605, 15606, 15846), and Kanatak/Ruth Lake (15885) blocks during ALMS and ORPC on the Alaska Peninsula/Becharof NWR, 2004-2014.

ALMS Block Name	Dog Salmon River						
ALMS Block Number	14878						
Year Surveyed	2004	2007	2010	2012		2014	
Visit Start Date	16-Jun	25-Jun	15-Jun	11-Jun		9-Jun	
Hours of Effort	25	30.5	20	32		24	
Kilometers of Effort	13	20	15	54		13	
	BS*	BS	BS	RA <sup>+</sup>	BS	RA	BS
Greater White-fronted Goose	Y	Y		C	Y	C	Y
Tundra Swan	N	P	N	C	P	A	P
American Wigeon	P	X		U	P	U	H
Mallard	H	X	X	U	P	U	P
Northern Shoveler		X		U	B	U	H
Northern Pintail			N	U	P	U	P
Green-winged Teal	H	X	X	U	H	U	H
Greater Scaup	P		X	C	P	C	P
White-winged Scoter	P	P		C	P	C	P
Black Scoter	P	P	X	C	P		
Common Goldeneye						U	X
Common Merganser	X						
Red-breasted Merganser				U	P		
Willow Ptarmigan	H	X	H	C	C	C	H
Red-throated Loon	P	X					
Common Loon	H	X	X	U	S	U	P
Red-necked Grebe	H					U	H
Unidentified Grebe							
Double-crested Cormorant		X					
Bald Eagle	X	X					
Northern Harrier	H						
Rough-legged Hawk							

Kanatak/Ruth Lake		Kanatak/Ruth Lake	
15885		15885	
2013		2014	
24-Jun		27-Jun	
25		10	
20		10	
RA	BS	RA	BS
U	P		
		X	U
C	H		
U	H		
C	P		
U	P	X	U
U	P	H	U



Table 2, con't. Avian species observed, including relative abundance (RA) and highest level of breeding behavior (BS), on the Dog Salmon (14878), Kejulik River (15605, 15606, 15846), and Kanatak/Ruth Lake (15885) blocks during ALMS and ORPC on the Alaska Peninsula/Becharof NWR, 2004-2014.

ALMS Block Name	Dog Salmon River						
ALMS Block Number	14878						
Year Surveyed	2004	2007	2010	2012		2014	
	BS	BS	BS	RA	BS	RA	BS
Sandhill Crane	P	P	P	C	P	C	H
Pacific Golden-Plover							
Semipalmated Plover							
Spotted Sandpiper							
Greater Yellowlegs	H	S	X				
Lesser Yellowlegs			H				
Marbled Godwit	P	A	H	C	N	C	C/P
Dunlin	S	S	S	U	C	C	C
Least Sandpiper	S	S	H	U	C	C	C
Short-billed Dowitcher	S			U	C	U	C
Wilson's Snipe	D	C	S	U	C	C	C
Parasitic Jaeger	P	X		U	H	U	H
Mew Gull	H	X	H	C	H	C	H
Glaucous-winged Gull	X	X				U	X
Arctic Tern	H	X	X	C	H	U	H
Short-eared Owl	H	X	X	U	H		
Alder Flycatcher							
Northern Shrike							
Black-billed Magpie							
Common Raven	X	X	X			U	X
Tree Swallow	X	X	X	U	H	C	X
Bank Swallow				U	N	C	H

Kanatak/Ruth Lake		Kanatak/Ruth Lake	
15885		15885	
2013		2014	
RA	BS	RA	BS
U	H		
U	C	D	U
U	H	X	U
U	C	C	U
U	H		
U	X	X	U
U	P		
		X	U

Table 2, con't. Avian species observed, including relative abundance (RA) and highest level of breeding behavior (BS), on the Dog Salmon (14878), Kejulik River (15605, 15606, 15846), and Kanatak/Ruth Lake (15885) blocks during ALMS and ORPC on the Alaska Peninsula/Becharof NWR, 2004-2014.

ALMS Block Name	Dog Salmon River						
ALMS Block Number	14878						
Year Surveyed	2004	2007	2010	2012		2014	
	BS	BS	BS	RA	BS	RA	BS
Black-capped Chickadee							
Gray-cheeked Thrush							
Hermit Thrush							
American Robin		S		U	S		
American Pipit							
Lapland Longspur	P	Y	S	C	S	C	S
Snow Bunting							
Northern Waterthrush							
Orange-crowned Warbler	S	S	S				
Yellow Warbler	S	S	S			U	S
Wilson's Warbler	S	S	S	U	S	U	S
American Tree Sparrow	S	S	S	C	S	C	S
Savannah Sparrow	N	S	S	C	S	C	A
Fox Sparrow							
White-crowned Sparrow	S						
Golden-crowned Sparrow		X					
Common Redpoll	H	S				C	S
Total Species	37	35	26	30		32	

Kanatak/Ruth Lake		Kanatak/Ruth Lake	
15885		15885	
2013		2014	
RA	BS	RA	BS
C	S	S	U
C	S	S	U
U	S	F	U
U	S	X	U
U	S	X	U
C	S	S	U
C	S	S	U
C	S	S	C
U	S		
C	F	S	C
C	S	S	U
C	A	S	C
C	S	H	U
26		20	

Table 2, con't. Avian species observed, including relative abundance (RA) and highest level of breeding behavior (BS), on the Dog Salmon (14878), Kejulik River (15605, 15606, 15846), and Kanatak/Ruth Lake (15885) blocks during ALMS and ORPC on the Alaska Peninsula/Becharof NWR, 2004-2014.

ALMS Block Name	Kejulik River Lower ALMS				Upper Kejulik			
ALMS Block Number	15605				15846	15846 & 15606		
Year Surveyed	2012		2014		2012	2014		
Visit Start Date	21-Jun		23-Jun		20-Jun	21-Jun		
Hours of Effort	24		31		8	3		
Kilometers of Effort	20.5		16.5		2	0.5		
	RA	BS	RA	BS	RA	BS	RA	BS
Greater White-fronted Goose	U	P	U	H				
Tundra Swan	C	P	C	H	U	H	U	P
American Wigeon	U	N	U	P	U	P		
Mallard			U	H	U	H	U	Y
Northern Shoveler								
Northern Pintail								
Green-winged Teal	U	H	U	H				
Greater Scaup	U	H	C	P	C	P		
White-winged Scoter								
Black Scoter	U	P	C	P				
Common Goldeneye			U	H				
Common Merganser			C	P			U	H
Red-breasted Merganser	U	P			C	P	U	Y
Willow Ptarmigan	C	C	U	C	U	C		
Red-throated Loon	U	H	U	H			U	X
Common Loon								
Red-necked Grebe			U	H				
Unidentified Grebe	U	X						
Double-crested Cormorant			C	H				
Bald Eagle			C	H	U	H	U	X
Northern Harrier	U	H	U	H	U	H		
Rough-legged Hawk					U	H		



Table 2, con't. Avian species observed, including relative abundance (RA) and highest level of breeding behavior (BS), on the Dog Salmon (14878), Kejulik River (15605, 15606, 15846), and Kanatak/Ruth Lake (15885) blocks during ALMS and ORPC on the Alaska Peninsula/Becharof NWR, 2004-2014.

ALMS Block Name	Kejulik River Lower ALMS				Upper Kejulik			
ALMS Block Number	15605				15846	15846 & 15606		
Year Surveyed	2012		2014		2012		2014	
	RA	BS	RA	BS	RA	BS	RA	BS
Sandhill Crane	C	H	U	X	U	H		
Pacific Golden-Plover	U	H						
Semipalmated Plover	U	H						
Spotted Sandpiper	U	H	C	C	C	H	C	H
Greater Yellowlegs	C	A	U	C	U	H	U	C
Lesser Yellowlegs								
Marbled Godwit			U	C				
Dunlin								
Least Sandpiper	C	A	C	D	U	H	U	C
Short-billed Dowitcher	C	C	U	C	U	H	U	C
Wilson's Snipe	C	C	C	C	U	C		
Parasitic Jaeger	U	H	U	H				
Mew Gull	U	H	U	X	U	H	U	X
Glaucous-winged Gull			U	X				
Arctic Tern			C	X				
Short-eared Owl								
Alder Flycatcher					C	S	C	S
Northern Shrike	U	H						
Black-billed Magpie	U	H	U	X	U	H	U	X
Common Raven	U	H	U	X	U	H		
Tree Swallow	U	H			U	H	U	H
Bank Swallow	U	H	A	N	A	N	U	N

Table 2, con't. Avian species observed, including relative abundance (RA) and highest level of breeding behavior (BS), on the Dog Salmon (14878), Kejulik River (15605, 15606, 15846), and Kanatak/Ruth Lake (15885) blocks during ALMS and ORPC on the Alaska Peninsula/Becharof NWR, 2004-2014.

ALMS Block Name	Kejulik River Lower ALMS				Upper Kejulik			
ALMS Block Number	15605				15846	15846 & 15606		
Year Surveyed	2012		2014		2012		2014	
	RA	BS	RA	BS	RA	BS	RA	BS
Black-capped Chickadee			U	X			U	X
Gray-cheeked Thrush	U	H	U	S	U	S	U	S
Hermit Thrush	C	S	C	S	U	S	C	S
American Robin			U	S	C	S	U	S
American Pipit								
Lapland Longspur	C	S	C	Y				
Snow Bunting								
Northern Waterthrush					U	S	U	S
Orange-crowned Warbler	C	S	C	S	U	S	C	S
Yellow Warbler			U	S	U	S	C	S
Wilson's Warbler	A	S	C	S	C	S	C	S
American Tree Sparrow	A	S	C	S	C	S	U	S
Savannah Sparrow	C	S	C	S	U	S	C	S
Fox Sparrow	U	S	U	S	C	S	C	S
White-crowned Sparrow								
Golden-crowned Sparrow	C	S	C	S	C	S	C	S
Common Redpoll	C	S	C	S	C	S	U	S
Total Species	36		42		33		41	

**\*Breeding Behavior Evidence Codes:** X - Detected, no breeding evidence, M - Apparent migratory overflight, H - Observed in Possible nesting habitat, P - pair observed in suitable nesting habitat, S - Singing male, C - Courtship display, A - Alarm Calling, B - Building or excavating nests, F - Adult with fecal sac or food, D - Distraction display, N - Nest observed, Y - Downly or recently fledged young

**\*Abundance Codes:** A - Abundant (> 25 birds per day), C - Common (5-25 birds per day), U - Uncommon (0-4 birds per day)

al. 1996, Moore & Leeman 1996, Wightman et al. 2002, Savage In Prep.), and at Bible Camp (Adler & Savage 1999) from the mid-1980s through the late 2000's.

The point counts on the Dog Salmon resulted in 27 species and 328 individual bird detections (Table 3). Of these detections, 119 individuals and eight species were of landbirds. The number of landbird detections at the Dog Salmon block was low compared with 2004, similar to 2007 and higher than 2010 and 2012. A flock of non-breeding tundra swans drove the high count for that species and also the total number of birds. Compared to previous years, common loons and marbled godwit counts were high while sandhill crane counts were low. Some landbird species were higher than the past few years, although none except tree swallow exceeded the 2004 counts; Wilson's warbler was not detected this year. The reader is cautioned that these are relative counts and a change in actual densities can only be detected when a distance analysis correcting for observer detection is conducted. Comparison of vegetation from point photos between 2004, 2012 and 2014 indicate that although our calendar timing was more similar between 2012 and 2014 (visited 2 days earlier in 2014), the seasonal development of plant material was more similar between 2004 and 2014 (visited earlier by 1 week in 2014). This may account for the rebound in landbird numbers from 2012 to 2014.

The point counts on Kejulik River resulted in the detection of 266 individual birds of 27 species; 191 detections of 15 species were landbirds. The total numbers were similar at Kejulik between 2012 and 2014, but individual species show some differences. Willow ptarmigan, greater yellowlegs, and American tree sparrow counts were lower, while short-billed dowitcher, American robin, and Lapland longspurs were detected in greater numbers. The 2012 and 2014 visits were similar with regard to calendar date, but photos show some differences with regard to green-up. As on the Dog Salmon, areas of the plot appear greener, and shrubs seem to show some recovery from caterpillar defoliation in 2014.

Three factors encouraged us to resample vegetation in 2014 at the Dog Salmon: it had been ten years since we first sampled the Dog Salmon plot, as the first author collected the vegetation data in 2004 an opportunity arose for data to be collected by the same observer, and there had been much inter-year variation in the vegetation data collected by different observers. A summary of the vegetation data collected (Table 4) shows little change in the amount of low and tall shrub between 2004 and 2014. The major change is a reduction in the amount of dwarf shrub, and an increase in the amount of mesic graminoid herbaceous (MGH); two more subtle changes include a small reduction in the amount of the wet graminoid herbaceous (WGH) class and a loss of willow dwarf shrub (WDS). A point-by-point examination of the data indicated that most points experienced no change. Point 5 and point 8 both were classified as ericaceous dwarf shrub (EDS) in 2004 and as MGH in 2014. It appears that there was a subtle shift at point 5 from dominance of wetland plants Labrador tea and sedge species to plants preferring drier environments (i.e., crowberry and "grasses"). At point 8 there appears to be a shift also from sweetgale and Labrador tea, and unspecified sedges to a dominance of cotton grass with some dwarf birch (6-25%, below the 25% required for shrub classification). Point 9 was classified as 80% WGH and 20% WDS in 2004 and 100% MGH in 2014. This point appears to have dried a bit and become more uniform with a subtle shift to a dominance of herbaceous. To qualify as any shrub habitat, a cover of 25% is needed. Point 10 was classified as 100% WDS in 2004 and 100% EDS in 2014. Looking at the dominant species listed, there may also be a difference in classification due



Table 3. Species observed during the point count surveys including number of birds detected (Det.) and count of points where each species was observed (Points), ALMS Alaska Peninsula/Becharof NWR, 2004 - 2014. Landbird species in bold text.

ALMS Block name & Number	DOG SALMON 14878									
Year of Visit	2004		2007		2010		2012		2014	
Visit Start Date	16-Jun		25-Jun		15-Jun		11-Jun		9-Jun	
Number of points surveyed	16	16	16	16	16	16	16	16	16	16
Species - Common Name	Det.	Points	Det.	Points	Det.	Points	Det.	Points	Det.	Points
Greater White-fronted Goose			14	1			10	2	1	1
Tundra Swan	4	3	8	5	7	4	12	5	83	7
American Wigeon	2	1	1	1			2	1	2	2
Mallard	1	1	4	2	1	1	4	2	3	1
Northern Shoveler							1	1	1	1
Northern Pintail							3	2	1	1
Green-winged Teal			2	1					1	1
Greater Scaup	1	1	12	4	4	2	13	4	5	3
White-winged Scoter	2	1	2	1			11	4	6	1
Black Scoter	2	1	13	2	5	2	4	2		
Common Merganser										
Red-breasted Merganser										
<b>Willow Ptarmigan</b>			1	1	2	2	3	3	1	1
Red-throated Loon			1	1						
Common Loon	2	2	5	4	2	2	4	4	10	8
Red-necked Grebe	1	1							1	1
<b>Northern Harrier</b>										
Sandhill Crane	17	8	55	16	33	15	25	9	11	8
Pacific Golden-Plover										
Semipalmated Plover										
Greater Yellowlegs	1	1			4	4				
Marbled Godwit	24	13	46	15	45	16	32	12	52	16
Dunlin	17	12	7	6	13	10	5	2	3	2
Least Sandpiper	12	10	17	7	3	3	2	2	7	6
Short-billed Dowitcher	1	1	2	2			2	1	1	1
Wilson's Snipe	12	10	8	8	10	9	6	4	5	5
Parasitic Jaeger	3	3								
Mew Gull	7	5	2	2	17	8	11	4	15	7
Glaucous-winged Gull	1	1	19	11					1	1
Unknown Gull										

Table 3, con't. Species observed during the point count surveys including number of birds detected (Det.) and count of points where each species was observed (Points), ALMS Alaska Peninsula/Becharof NWR, 2004 - 2014. Landbird species in bold text.

ALMS Block name & Number	KEJULIK 15605			
Year of Visit	2012		2014	
Visit Start Date	20-Jun		21-Jun	
Number of points surveyed	20	20	20	20
Species - Common Name	Det.	Points	Det.	Points
Greater White-fronted Goose	4	1	1	1
Tundra Swan	10	7	13	7
American Wigeon				
Mallard			1	1
Northern Shoveler				
Northern Pintail				
Green-winged Teal				
Greater Scaup				
White-winged Scoter				
Black Scoter	3	2	5	2
Common Merganser			1	1
Red-breasted Merganser	1	1		
<b>Willow Ptarmigan</b>	20	13	4	4
Red-throated Loon	9	7	1	1
Common Loon				
Red-necked Grebe	1	1		
<b>Northern Harrier</b>	1	1		
Sandhill Crane	4	4		
Pacific Golden-Plover	2	2		
Semipalmated Plover				
Greater Yellowlegs	6	4	1	1
Marbled Godwit			1	1
Dunlin				
Least Sandpiper	17	8	22	13
Short-billed Dowitcher	5	3	10	8
Wilson's Snipe	13	8	14	10
Parasitic Jaeger	1	1		
Mew Gull	4	3	3	2
Glaucous-winged Gull			2	1
Unknown Gull				

Table 3, con't. Species observed during the point count surveys including number of birds detected (Det.) and count of points where each species was observed (Points), ALMS Alaska Peninsula/Becharof NWR, 2004 - 2014. Landbird species in bold text.

ALMS Block name & Number	DOG SALMON 14878									
Year of Visit	2004		2007		2010		2012		2014	
Visit Start Date	16-Jun		25-Jun		15-Jun		11-Jun		9-Jun	
Number of points surveyed	16	16	16	16	16	16	16	16	16	16
Species - Common Name	Det.	Points	Det.	Points	Det.	Points	Det.	Points	Det.	Points
Arctic Tern	2	1	5	3	1	1	3	1		
<b>Short-eared Owl</b>			3	3			1	1		
<b>Black-billed Magpie</b>										
<b>Common Raven</b>	1	1								
<b>Tree Swallow</b>	4	4	2	2	1	1			10	4
<b>Bank Swallow</b>							1	1	3	1
<b>Gray-cheeked Thrush</b>										
<b>Hermit Thrush</b>										
<b>American Robin</b>			2	1						
<b>American Pipit</b>										
<b>Lapland Longspur</b>	37	14	26	12	12	8	15	8	25	11
<b>Orange-crowned Warbler</b>	3	2	4	4	3	3				
<b>Yellow Warbler</b>	4	3	1	1	1	1			2	1
<b>Wilson's Warbler</b>	3	2	1	1	2	2	1	1		
<b>American Tree Sparrow</b>	26	11	16	10	22	13	13	9	26	13
<b>Savannah Sparrow</b>	65	16	55	16	49	16	32	15	43	15
<b>Fox Sparrow</b>										
<b>White-crowned Sparrow</b>	1	1	1	1						
<b>Golden-crowned Sparrow</b>										
<b>Unknown Sparrow</b>							3	2		
<b>Common Redpoll</b>	14	10	1	1			1	1	9	8
Total number of birds detected on point counts	270		336		237		220		328	
Total number of landbird detections	158		113		92		70		119	
Total number of species observed per block	29		31		21		30		27	



Table 3, con't. Species observed during the point count surveys including number of birds detected (Det.) and count of points where each species was observed (Points), ALMS Alaska Peninsula/Becharof NWR, 2004 - 2014. Landbird species in bold text.

ALMS Block name & Number	KEJULIK 15605			
Year of Visit	2012		2014	
Visit Start Date	20-Jun		21-Jun	
Number of points surveyed	20	20	20	20
Species - Common Name	Det.	Points	Det.	Points
Arctic Tern				
<b>Short-eared Owl</b>				
<b>Black-billed Magpie</b>	2	1	1	1
<b>Common Raven</b>	3	3	1	1
<b>Tree Swallow</b>				0
<b>Bank Swallow</b>			4	1
<b>Gray-checked Thrush</b>	1	1		
<b>Hermit Thrush</b>	8	5	4	3
<b>American Robin</b>			9	8
<b>American Pipit</b>				
<b>Lapland Longspur</b>	15	5	27	13
<b>Orange-crowned Warbler</b>	18	10	17	13
<b>Yellow Warbler</b>				
<b>Wilson's Warbler</b>	11	8	16	10
<b>American Tree Sparrow</b>	36	18	24	16
<b>Savannah Sparrow</b>	43	19	47	19
<b>Fox Sparrow</b>	1	1	2	2
<b>White-crowned Sparrow</b>				
<b>Golden-crowned Sparrow</b>	18	13	16	10
<b>Unknown Sparrow</b>				
<b>Common Redpoll</b>	13	7	19	17
Total number of birds detected on point counts	270		266	
Total number of landbird detections	190		191	
Total number of species observed per block	31		27	

Table 4. Comparison of Viereck vegetation classes for the Dog Salmon (14878) block during ALMS, Alaska Peninsula/Becharof NWR 2004 - 2014.

Year	Points Surveyed <sup>1</sup>	Water & Wetland	Wet Forb Herb	Wet Gram Herb	Mesic Forb Herb	Mesic Gram Herb	Eric Dwarf Shrub	Willow Dwarf Shrub	Open Low Shrub	Closed Low Shrub	Open Tall Shrub	Closed Tall Shrub
2004	16	6.6	0.3	10.9		10.3	49.4	7.5	6.6		8.1	0.3
2007	16	7.8		20.0	0.9	8.1	43.8			14.1		5.3
2010	16	6.9	2.8	61.6					15.6	0.6	12.5	
2012	16	9.1				87.2	0.0		1.6		2.2	
2014	16	6.6		3.8		30.6	41.9		5.0	3.4	8.8	

to birch being classified as WDS in 2004 and not in 2014. Thus these subtle changes at individual points have driven a subtle change in the overall plot composition.

Since it had only been two years since visiting Kejulik River we did not collect vegetation data there, although we did take photos of all the points. Vegetation data was collected at the new point 6 on the Kanatak trail. Vegetation at the new point 6 appears very similar to the vegetation at the original point 6.

We detected twelve species of mammals during our landbird surveys (Table 5). Brown bear was the most commonly detected species with the greatest amount of visual detection. Most other species were detected by sign or tracks. Moose evidence was found on the Kejulik River; caribou evidence was found at all locations. The smaller mammals recorded included: snowshoe hare, beaver, otter, arctic ground squirrel, red squirrel, vole species, and red fox.

Table 5. Mammalian species observed, including highest level of evidence\*, on the King Salmon BBS, on the Dog Salmon (14878), Kejulik River (15605, 15606, 15846), and Kanatak/Ruth Lake (15885) blocks during ALMS and ORPC, on the Alaska Peninsula/Becharof NWR, 2014.

	King Salmon	Dog Salmon River	Kanatak/ Ruth Lake	Kejulik ALMS	Upper Kejulik	
	BBS	14878	14885	15605	15606	15846
Visit Start Date	4-Jun	9-Jun	27-Jun	23-Jun	21-Jun	
Arctic ground squirrel				S		V
Red squirrel	V					
Beaver		V	D	D		
Vole species				V		
Porcupine		S				
Snowshoe hare						
Red fox		S		V	T	
Wolf		T				S
Brown bear		S	V	V	V	
River otter				T		
Moose				S		T
Caribou		S	T	V		

\*Level of evidence: V - Visual/Vocal, S - Sign, T - Tracks, D - Dams

The actual costs to the Refuge of the 2014 survey effort involved travel, staffing and minor gear expenses (Appendix III). Although costs to the Refuge were lower due to the Regional Office contribution, the actual costs (\$8,886) increased from 2012 (\$7,884) to 2014 for the same effort. This year most of the costs were in charter transportation as opposed to 2012 when the Refuge was able to complete transportation in-house, yet had higher staffing costs. The most important

information from this table are the actual hours of flying for aircraft to various locations and the list of general types of costs required, making budget estimation easier in future.

These data will be contributed to the statewide landbird monitoring effort for Alaska compiled by USGS-Alaska Science Center. In 2012 the Refuge had established our complement set of four blocks as suggested in Handel and Matsuoka (2007) and our efforts in 2013 and 2014 complete one full repetition of this set of blocks.

### Recommendations for the Future

Continued landbird work is outlined in the Refuge draft Wildlife Inventory Plan and in the Refuge's Comprehensive Conservation Plan. Since the writing of that plan our emphasis has moved away from breeding season and migration banding at specific locations to point counting over a broader area of the region. We recommend continuing the program outlined here: the Breeding Bird Survey in King Salmon, the established four ALMS blocks on an alternating schedule (Ugashik and King Salmon River in odd years and Dog Salmon and Kejulik in even years), and the off-road point-count along the Kanatak Trail at least every other year. The Regional I&M program coordinator again supported our ALMS efforts with a small financial contribution.

Recommendations to improve our surveys include:

- Recruit or train several primary observers so several teams can survey from early June to June 24 completing all surveys by the third week in June.
- Discuss with Handel (USGS) and Matsuoka (USFWS-Migratory Bird Management) potential biases from having three of four ALMS plots centered on rivers.
- Pre-field training and coordination with regard to habitat data collection including: Viereck class definitions, what determines a vegetation layer, the definition of litter, and patch heterogeneity. Since no formal training exists, this should consist of supervisors and field staff reviewing the instructions in Handel and Cady (2004), discussing them, and conducting several vegetation sampling practice points together prior to the field season.
- Continued training in bird identification and distance estimation even for experienced observers.

Winter work for 2014/2015 includes creation of a file geodatabase for ALMS populated with all of the correct point positions (in NAD 83) and all of the historic data points as well as the reference blocks that are frequently used for other Refuge projects. Other older, confusing GIS data can then be deleted.

### Acknowledgements

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## **Appendix I.** Visit Summaries for Blocks visited in 2014.

### **Visit Summary for Block 14878 Dog Salmon ALMS**

**Land Unit:** Alaska Peninsula NWR

**Block Number/Name:** 14878 Dog Salmon

**Dates:** 9 -12 June 2014

**Points Completed:** 15, 10, 5, 4, 3, 2, 9, 8, 7, 6, 11, 12, 13, 14, 18, 19

**Observers:** Susan Savage, Jessica Howell

**Hours surveying & hiking on block:** 19.0

**Topography:** This location is flat, open, and relatively uniform. It is soggy and requires hip boots. The vegetation consists of dwarf birch, crowberry, Labrador tea, other dwarf and low shrubs, *Carex spp.*, Blue joint grass and other grasses, mosses, and quite a number of obligate and facultative wetland species. Patches of willow shrubs 1 to 3 meters tall grow along the Dog Salmon River. There is a lot of beaver sign near the river, seasonal flooding at a few riverside points, and bank erosion that may require moving some points in the future. The Dog Salmon River also bisects the block making a boat necessary for crossing and conducting surveys.

**Time required:** On 9 June contract transporter Katmai Air carried Savage and Howell to the Dog Salmon River in a C206 float plane in the afternoon. The team set up camp. On 10 June weather was adequate to conduct bird surveys at points 15, 10, 5, 4, 3, and 2. On the return to camp, habitat data were collected. On 11 June, with generally good weather, punctuated by very light precipitation, we canoed across the river and conducted point counts on points 9, 8, 7, 6, 11, 12, and 13. We collected habitat data by backtracking through the points on our return to the canoe. On 12 June, good weather allowed completion of point counts at points 14, 19 and 18. Since there was adequate time to complete point-counts before 10 AM, we collected habitat data after completing each point count. Savage was the primary observer, however Howell practiced bird counting at each point. We canoed back across the river, completed paperwork, broke camp and were picked up by Katmai Air in a C206 on floats.

**Camp:** N 57.40210, W 157.24830 (NAD 83; approximate)

**Camp location:** The camp location was on the east side of the river between points 9 and 10. This whole block is rather wet but this location seemed to be slightly higher in elevation and was protected by willow shrubs. The area is very grassy and extensive grass cutting was needed to prevent grounding of the electric fence.

**Grid Route:** Points were completed as follows:

10 June – 15, 10, 5, 4, 3, 2.

11 June – 9, 8, 7, 6, 11, 12, 13

12 June – 14, 18, 19

**Skipped points:** The survey team repeated the same routes and surveyed the same points that were completed in 2004, 2007, 2010 and 2012. See Appendix 8 in the Alaska Landbird

Monitoring Survey June 2004 report (Sesser and Jehle 2005) for more details concerning points that were skipped.

**Water crossings:** The Dog Salmon River is wide and is tidally influenced. Since two point survey routes are located on both sides of the river, a canoe was used to cross the river. Hip boots are also required for wading in the river and for getting around in such a wet block.

**Wildlife notes:** Marbled godwits were common. Waterbird diversity was high and greater; white-fronted geese young were noted. Thirty-two bird species were encountered. Mammal detections included visuals of a beaver and sign from brown bear, caribou, porcupine, red fox and wolf tracks.

**Access:** Katmai Air carried the crew to the Dog Salmon River in a C206 float plane. The pilot was able to taxi the crew to shore without much difficulty and the crew was able to unload gear without getting into the water. The water was murky and difficult to tell how deep it was. Generally, the middle of the river is deeper and the tide (especially the larger one) seems to have an effect on the river level.

A two-man inflatable canoe was used to cross the river and access both sides of the block. Crossing the river is relatively easy and can be done in any conditions where a survey is possible. Wave height can reach 0.3 meters in high winds, but surveying would be difficult given those conditions anyway. An Egegik tide table may be helpful in coordinating transportation, especially during the higher of the two tides. We noted as in the past that adding three hours to the time of high tide at Egegik provides an estimate of high tide at this location.



## **Visit Summary for Block 15605 Kejulik River ALMS**

**Land Unit:** Becharof NWR

**Block Number/Name:** 15605 / Kejulik ALMS

**Dates:** 20-24 June 2012

**Points Completed:** 1, 2, 6,7,8,9, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23 and 24

**Observers:** Kevin J. Payne, Jessica Howell

**Hours surveying & hiking on block:** 18

**Topography:** The block is primarily north of the Kejulik River at a river bend. Several of the southern or eastern points are in the river or on islands separated from the rest of the block by non-wadable channels. We did not attempt those points. Most of the block is a Pleistocene flood plain about 10 m higher than the river channel (above a pronounced cut bank). One point is on a historically abandoned river channel just above current channel level and another point is at the bottom of the cut bank bordering a very wet meadow. There is a hill on the north-central part of the block and a few points are on the slope or at the toe of the hill. The hill is not very steep and it is covered with patchy tall and dwarf shrub. Dwarf shrub (often hummocky) and mesic meadow cover most of the block. A few points are in wetter meadow (succeeding lake beds). Along old lake rims and the river banks, taller shrub thickets generally less than 50 m in width are found. Hip waders are recommended for the block.

**Time required:** At about 1430 on 21 June FWS Pilot Kevin Fox took Payne and Howell in two flights in the Husky to Phil Shoemaker's upper Kejulik Airstrip. The raft and other gear followed in a third trip. On 22 June we pumped up and packed the canoe and began floating the river. The water level was lower than in 2012 but the current in the upper river was still relatively fast (~6-8 km/hr) with some sweepers. The river slowed as we approached the block. We arrived near our designated camping spot about 1500 and had camp set up by 1600.

It rained all day on 23 June so no surveying was done. On 24 June we hiked directly toward point 2, cutting across the wet boggy area adjacent to camp. The crew completed points 2, 1, 6, 11, 16, 21, 22, 17. From point 17, they returned to camp (1.8 km). On 25 June we hiked to and completed points 8, 7, 12, 13, 18, 23, 24, 20, and 19 and returned to camp (1.4 km). The day was partly cloudy with no winds or precipitation. On the morning of 26 June we completed points 9, 15, and 14. Payne counted birds on all days, however Howell practiced bird counting at each point.

After completing the count on 26 June, we returned to camp (~ 800 m) and began packing up. We made our daily check-in and decided to begin floating by 0900 as there was a chance we could be picked up that day. Since the river level was lower than 2012 (the previous survey year), we floated to Becharof Lake and were picked up by Katmai Air at ~1700. At times the lower river was braided and very shallow. On a few occasions we walked the canoe in the shallows to find a better channel. Upon reaching the terminus of the Kejulik River we took the southern braid which provided easy access to Becharof Lake. The Kejulik River system is very dynamic so the southern route may not work in future years. Also note, we experienced little wind on the post plot float; the float from camp was approximately six hours.

**Camp:** 57.867°/-155.736° (NAD 83)

**Camp location:** We camped on a small island separated from the north side of the river by wadable rivulets. We were between points 3 and 4 (both in the river). Under high flow conditions, this island may be underwater. It was 80 – 90 cm above river level on our visit. The river level rose after the rains of the 22<sup>nd</sup> and 23<sup>rd</sup> but gradually fell afterward. The campsite had significant grass/forb growth and some low shrub cover. We did little vegetation cutting to put up our electric fence.

**Grid Route:** On 22 June surveyed points 2, 1, 6, 11, 16, 21, 22, 17. On 23 June we surveyed points 8, 7, 12, 13, 18, 23, 24, 20, and 19. On 24 June we completed points 9, 15, and 14.

**Skipped points:** Points 1, 2, 3, 10, and 25 were either in the river, on an island or on the south side of the river. We did not attempt to reach island or south shore points because this would require leaving the inflatable canoe on the river shore unprotected from bears while we completed survey points.

**Water crossings:** The Kejulik River is less than 10 m wide at the put-in location and gradually widens to > 150 m including side sandbars. Per above, we restricted our survey to the north side of the block. Once at camp, teams must cross rivulets that could vary in depth from ankle to thigh deep. Once across all river channels, no significant streams need crossing. However several points are in wetlands or wetlands must be crossed to reach points. Obviously the inflatable canoe is required to reach and leave the block. Hip waders are required for wading in the river and for getting around in the block. One crew member penetrated the bog, so we recommend taking the trail upstream from camp on the backside of the riparian brush. This trail provides a dry route to the top of the bluff. Follow the bluff around to start each day. This route adds some distance to the initial walk but avoids a fairly substantial area of “quaking bog” especially at the toe of the bluff which can be at best difficult and time consuming to cross and at worse, dangerous.

**Wildlife notes:** Marbled godwit were noted on the block. Alder flycatchers and northern waterthrush were noted at the upper airstrip (along the river) and infrequently along the river bank. We encountered approximately ten bears during the course of the trip but none exhibited any aggressive behavior. Other mammals visuals included: red fox, several caribou (including several calves), and a few voles. Sign, tracks or dams were noted for arctic ground squirrel, beaver, moose, and river otter.

**Access:** Three loads in the Husky took us to Shoemaker’s upper Kejulik airstrip. We had permission from Phil Shoemaker to land there. The strip is located at: (57.9652°, -155.503°).

A two-person 17’ Incept inflatable canoe was used to float down from the access point to the block and to float from the block to the pick-up location. The canoe can carry 800 pounds; our body weight and gear was 700 pounds, and bulk wise, the canoe was full.

**Visit Summary for Block 14885 Ruth Lake/Kanatak****Land Unit:** Becharof NWR**Block Number/Name:** 14885 / Ruth Lake**Dates:** 26-28 June 2014**Points Completed:** Pt 6 relocated, vegetation data collected, no bird surveys**Observers:** Kevin J. Payne, Jessica Howell**Hours surveying & hiking on block:** 10

**Topography:** The main trail lies about 345m NW of camp at Ruth Lake near the crest of a ridge; across a small ravine and creek (that can be stepped across) en route to the trail. To the southeast, follow the remnants of the trail, using GPS points to navigate through medium shrub down through two vegetation lush creek valleys. The second creek is about 3 m wide and less than 35 cm deep wide and requires wading. We crossed at 57.59625°, -156.093388°. Immediately after this second creek, the climb to the pass begins. The trail meanders through dwarf shrub with thickets of alder and is not clearly marked. There are two trails at this point, a human trail and a “jeep” trail. The climb is steady, but not very steep. Another creek is crossed just before the summit and the trail enters a wet shrub mat/barren basin. Following another short, low slope climb, the trail encounters Summit Lake. The trail skirts the north edge of the lake. There is little vegetation in this area. After the lake, the trail descends along a creek valley through barren habitat and dwarf shrub. The trail finally descends down a steep scree slope which we did not attempt on this trip due to winds exceeding 50 mph at the summit. An additional point could be added at this end of the route. On the return, we took the alternate route around the waterfall and relocated point 6 as suggested by Savage.

To the northwest (from camp) the trail follows just below the ridge line to Ruth River. Follow the cleared areas through alder/willow patches which now are well grassed. Through dwarf shrub patches the trail is more difficult to find. The trail descends slowly to Ruth River. It appears that the river can be crossed in hip waders, although we didn't attempt it. An alternate route would be to follow the river to Island Arm through dense willow and alder (we did not see an obvious cleared path through this route).

**Time required:** On 26 June, Payne and Howell were flown from Becharof Lake to Ruth Lake by Katmai Air in a Cessna 206. At approximately 2am on 27 June, winds began and were recorded at 15-20 mph later that morning. Conditions remained the same through 28 June, when the crew was picked up by Katmai Air without completing the survey. Due to the nature of the pass, we recommend arriving earlier in the season and allowing more days for the possibility of inclement weather.

**Camp:** 57.597516, -156.110580 (NAD 83)

**Camp location:** We placed our camp at Ruth Lake so that part of the trail could be completed one day and the second part on the next day without back-tracking. A camp site at Island Arm is problematic because it would likely have to be placed on Native Corporation Land and the access would either require crossing Ruth River or landing in a very shallow bay of the lake. We camped just off the shore.

**Grid Route:** Survey was unable to be completed. Point 6 was relocated to an alternate route (Figure 5).

**Skipped points:** Survey was unable to be completed.

**Water crossings:** Several small drainages (that can be stepped over) and one small creek (see crossing location above) that must be waded were crossed to survey from point 2 to 14. To attempt point 1, chest waders or a small boat are required. The logistics of bringing in a boat/inflatable raft for this one point are complicated. We hiked the trail in hiking boots.

**Wildlife notes:** Bear sign was common along the trail and we sighted three bears; one bear on the opposite side of Ruth Lake, one along the northwest portion of the trail, and one downslope from point 6. Caribou sign was fairly common. Other mammal sign was present but less common. Although the survey was unable to be completed, incidental observations of birds included common loon, bald eagle, American robin, several species of sparrows, and American pipit. High winds largely prevented aural detection.

**Access:** The plot was accessed using the Katmai Air's Cessna 206 on floats. Windy weather in the Ruth Lake area is notorious for making access difficult. Steep mountains and the proximity to the Pacific Coast create intense weather in this area.

Appendix II. List of Common and Scientific Names<sup>1</sup> of Species appearing in the Landbird Monitoring Activities, Alaska Peninsula/Becharof NWR June 2014.

Birds			
Common Name	Scientific Name	Common Name	Scientific Name
Greater White-fronted Goose	<i>Anser albifrons</i>	Pacific Golden-plover	<i>Pluvialis fulva</i>
Tundra Swan	<i>Cygnus columbianus</i>	Semipalmated Plover	<i>Charadrius semipalmatus</i>
American Wigeon	<i>Anas americana</i>	Spotted Sandpiper	<i>Actitis macularius</i>
Mallard	<i>Anas platyrhynchos</i>	Greater Yellowlegs	<i>Tringa melanoleuca</i>
Northern Shoveler	<i>Anas clypeata</i>	Lesser Yellowlegs	<i>Tringa flavipes</i>
Northern Pintail	<i>Anas acuta</i>	Hudsonian Godwit	<i>Limosa haemastica</i>
Green-winged Teal	<i>Anas crecca</i>	Marbled Godwit	<i>Limosa fedoa</i>
Greater Scaup	<i>Aythya marila</i>	Dunlin	<i>Calidris alpina</i>
White-winged Scoter	<i>Melanitta fusca</i>	Least Sandpiper	<i>Calidris minutilla</i>
Black Scoter	<i>Melanitta americana</i>	Short-billed Dowitcher	<i>Limodromus griseus</i>
Long-tailed Duck	<i>Clangula hyemalis</i>	Wilson's Snipe	<i>Gallinago delicata</i>
Common Goldeneye	<i>Bucephala clangula</i>	Parasitic Jaeger	<i>Stercorarius parasiticus</i>
Common Merganser	<i>Mergus merganser</i>	Long-tailed Jaeger	<i>Stercorarius longicaudus</i>
Red-breasted Merganser	<i>Mergus serrator</i>	Mew Gull	<i>Larus canus</i>
Willow Ptarmigan	<i>Lagopus lagopus</i>	Glaucous-winged Gull	<i>Larus glaucescens</i>
Red-throated Loon	<i>Gavia stellata</i>	Aleutian Tern	<i>Onychoprion aleuticus</i>
Pacific Loon	<i>Gavia pacifica</i>	Arctic Tern	<i>Sterna paradisaea</i>
Common Loon	<i>Gavia immer</i>	Short-eared Owl	<i>Asio flammeus</i>
Red-necked Grebe	<i>Podiceps grisegena</i>	Alder Flycatcher	<i>Empidonax alnorum</i>
Unidentified Grebe	<i>Podiceps sp.</i>	Northern Shrike	<i>Lanius excubitor</i>
Double-crested Cormorant	<i>Phalacrocorax auritus</i>	Gray Jay	<i>Perisoreus canadensis</i>
Bald Eagle	<i>Haliaeetus leucocephalus</i>	Black-billed Magpie	<i>Pica hudsonia</i>
Northern Harrier	<i>Circus cyaneus</i>	Common Raven	<i>Corvus corax</i>
Rough-legged Hawk	<i>Buteo lagopus</i>	Tree Swallow	<i>Tachycineta bicolor</i>
Merlin	<i>Falco columbarius</i>	Bank Swallow	<i>Riparia riparia</i>
Sandhill Crane	<i>Grus canadensis</i>	Black-capped Chickadee	<i>Poecile atricapillus</i>
Black-bellied Plover	<i>Pluvialis squatarola</i>	Boreal Chickadee	<i>Poecile hudsonicus</i>



Appendix II, con't. List of Common and Scientific Names<sup>1</sup> of Species appearing in the Landbird Monitoring Activities, Alaska Peninsula/Becharof NWR June 2014.

Birds, con't		Mammals	
Gray-cheeked Thrush	<i>Catharus minimus</i>	Arctic Ground Squirrel	<i>Spermophilus parryii</i>
Swainson's Thrush	<i>Catharus ustulatus</i>	Red squirrel	<i>Tamiasciurus hudsonicus</i>
Hermit Thrush	<i>Catharus guttatus</i>	Beaver	<i>Castor canadensis</i>
American Robin	<i>Turdus migratorius</i>	Vole species	
Varied Thrush	<i>Ixoreus naevius</i>	Porcupine	<i>Microtus sp. or Myodes sp.</i>
American Pipit	<i>Anthus rubescens</i>	Snowshoe Hare	<i>Lepus americanus</i>
Lapland Longspur	<i>Calcarius lapponicus</i>	Wolf	<i>Canis lupus</i>
Snow Bunting	<i>Plectrophenax nivalis</i>	Red Fox	<i>Vulpes vulpes</i>
Northern Waterthrush	<i>Parkesia noveboracensis</i>	Brown Bear	<i>Ursus arctos</i>
Orange-crowned Warbler	<i>Oreothlypis celata</i>	River Otter	<i>Lontra canadensis</i>
Yellow Warbler	<i>Setophaga petechia</i>	Moose	<i>Alces americanus</i>
Blackpoll Warbler	<i>Setophaga striata</i>	Caribou	<i>Rangifer tarandus</i>
Myrtle Warbler	<i>Setophaga coronata</i>		
Wilson's Warbler	<i>Cardellina pusilla</i>		
American Tree Sparrow	<i>Spizella arborea</i>		
Savannah Sparrow	<i>Passerculus sandwichensis</i>		
Fox Sparrow	<i>Passerella iliaca</i>		
Lincoln's Sparrow	<i>Melospiza lincolnii</i>		
White-crowned Sparrow	<i>Zonotrichia leucophrys</i>		
Golden-crowned Sparrow	<i>Zonotrichia atricapilla</i>		
Slate-colored Junco	<i>Junco hyemalis</i>		
White-winged Crossbill	<i>Loxia leucoptera</i>		
Common Redpoll	<i>Acanthis flammea</i>		
		Plants	
		Cotton grass	<i>Eriophorum sp.</i>
		Sweetgale	<i>Myrica gale</i>
		Dwarf birch	<i>Betula nana</i>
		Labrador tea	<i>Ledum palustre</i>

<sup>1</sup> Birds ordered according to the AOU 54rd supplement (Chesser et al. 2013) and mammals according to the Checklist of Recent Alaska Mammals (MacDonald and Cook 2007).

**Appendix III.** Estimated expenses associated with ALMS and ORPC,  
Alaska Peninsula/Becharof NWR 2014.

	Cost	Totals
Plot Stakes, Misc	70	
Other Camping Gear (Refuge inventory)	Not Included	
Misc. Personal Gear (waders, raingear)	164	
Total Equipment, Supplies and Postage		234
Refuge Aircraft (Husky 3.1 hours)	388	
Charter Aircraft (Katmai Air 7.1 hours)	4,970	
Field Per diem & Travel Fees	180	
Field Food	300	
Total Transportation and Travel		5,838
Refuge Biologist, hourly	Refuge Base	
Refuge Maintenance Worker	Refuge Base	
Refuge Maintenance Worker (overtime: 24 hours)	1,284	
Refuge Intern (Food Allowance: field prep, data management, transport to King Salmon)	1,530	
Total Salary & Overtime		2,814
Total		8,886
Regional Inventory & Monitoring Funding for ALMS	(2,000)	
Refuge Cost		6,886